

What is claimed is:

1. A method of manufacturing semiconductor devices, comprising
the steps of:
 - 5 forming a sacrificial oxide film on a semiconductor substrate;
 - forming a triple well on the semiconductor substrate;
 - implanting an inert ion into the semiconductor substrate, by a given depth, to form an anti-diffusion layer;
 - implanting an ion for adjusting the threshold voltage into the
10 semiconductor substrate on the anti-diffusion layer;
 - removing the sacrificial oxide film and then sequentially forming a tunnel oxide film, a polysilicon layer and a pad nitride film on the semiconductor substrate;
 - patterning the pad nitride film by means of an isolation mask and then
15 sequentially etching exposed portions of the polysilicon layer, the tunnel oxide film and the semiconductor substrate to form a trench; and
 - forming an oxide film on the entire structure so that the trench is buried, planarizing the surface of the oxide film, and then removing remaining pad nitride film to form an isolation film within the trench.
- 20
2. The method as claimed in claim 1, wherein the inert ion is a nitrogen ion and is implanted using NH₃ as a source gas at the dose of 5E12 ~ 5E13 ion/cm² and with energy of 500 ~ 1500KeV.

3. The method as claimed in claim 1, wherein the sacrificial oxide film is formed in thickness of 70 ~ 100Å by means of cleaning process using a mixed solution of DHF(50:1) + SC-1(NH₄OH/H₂O₂/H₂O), or BOE(100:1 or 300:1) + SC-1(NH₄OH/H₂O₂/H₂O) at a temperature of 750 ~ 800 °C.

5

4. The method as claimed in claim 1, wherein the ion for adjusting the threshold voltage is a boron (B11) ion and is implanted at the dose of and 1E11 ~ 1E13 ion/cm².

10

5. The method as claimed in claim 1, wherein the sacrificial oxide film is removed by cleaning process us DHF(50:1) + SC-1(NH₄OH/H₂O₂/H₂O).

15

6. A method of manufacturing semiconductor devices, comprising the steps of:

20

forming a sacrificial oxide film on a semiconductor substrate;
forming a triple well on the semiconductor substrate;
implanting an ion of a heavy weight into a channel region of the semiconductor substrate to form an ion implantation layer;
implanting an ion for adjusting the threshold voltage into the ion implantation layer;
removing the sacrificial oxide film and then sequentially forming a tunnel oxide film, a polysilicon layer and a pad nitride film on the semiconductor substrate;

patternning the pad nitride film by means of an isolation mask and then sequentially etching exposed portions of the polysilicon layer, the tunnel oxide film and the semiconductor substrate to form a trench; and

5 forming an oxide film on the entire structure so that the trench is buried, planarizing the surface of the oxide film, and then removing remaining pad nitride film to form an isolation film within the trench.

7. The method as claimed in claim 6, wherein the ion of a heavy weight is an arsenic (As75) ion and is implanted at the dose of 5E11 ~ 5E13
10 ion/cm² and with energy of 10 ~ 100KeV.

8. The method as claimed in claim 6, wherein the sacrificial oxide film is formed in thickness of 70 ~ 100Å by means of cleaning process using a mixed solution of DHF(50:1) + SC-1(NH₄OH/H₂O₂/H₂O), or BOE(100:1 or
15 300:1) + SC-1(NH₄OH/H₂O₂/H₂O) at a temperature of 750 ~ 800 °C.

9. The method as claimed in claim 6, wherein the ion for adjusting the threshold voltage is a boron (B11) ion and is implanted at the dose of and 1E11 ~ 1E13 ion/cm².

20

10. The method as claimed in claim 6, wherein the sacrificial oxide film is removed by cleaning process us DHF(50:1) + SC-1(NH₄OH/H₂O₂/H₂O).